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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/643,646

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Andreas Docter

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EXAMINER

HANDAL, KAITLY V

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 05/01/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/643,646

Applicant(s)

DOCTER ET AL.

Examiner

Kaity Handal

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 21 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☐ Claim(s) \_\_\_\_\_ is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-10 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Applicant claims in claim 1 a start-up burner configured to meter an air supply to a mixing zone where air of the air supply is mixed with hot gas coming out of the burner unit.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-10 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear how the claimed start-up burner is configured to meter an air supply to a mixing zone where air of the air supply is mixed with hot gas coming out of the burner unit. Air entering the burner leaves the burner as combustion gas which is then sent to a mixing chamber as such. Therefore it is unclear

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how the burner would be metering air to a mixing chamber where it would mix with hot gases leaving the burner. Examiner notes that weight is not given to material worked on by the system in these apparatus claims in the case that the applicant intends to claim air being metered into a burner and where hot gas leaving the burner is metered to a mixing chamber prior to reforming.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 1-2, 7, and 9 are rejected under USC 102(b) as being anticipated by Goebel et al (US 6,838,062 B2), and in view of Vartanian et al. (4,943,493).

With respect to claim 1, Goebel teaches a fuel processor comprising a mixture formation chamber/inlet (fig. 1, 40) configured to form a mixture of a hydrocarbon or a hydrocarbon derivative/fuel (48) with water/steam (38) and air (36); an autothermal reactor/reformer (14) (col. 3, lines 54-62), the autothermal reactor/reformer (14) including a catalyst material (col.4, lines 50-54); and a temperature regulated (col. 4, lines 64-60) start-up burner including a burner unit (12) configured to combust the hydrocarbon/fuel (30) with air (28) so as to heat at least one of the mixture formation chamber/inlet (40) and the autothermal reactor/reformer (14) to a respective operating temperature (col. 5, lines 8-10 and col. 4, lines 50-53), said start-up burner

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(12) being configured to meter/flow an air supply to a mixing zone/inlet (40) where air of the air supply (28) is mixed with hot gas coming out of the burner unit (12), so as to regulate a temperature of the catalyst material, before the hot gas contacts the at least one of the mixture formation chamber and the autothermal reactor (col. 4, lines 54-60).

Goebel fails to explicitly teach a temperature regulated start-up burner configured to meter air. Vartanian teaches a fuel cell power plant which has a burner, a reformer and a fuel cell, wherein the air inlet (fig. 1, 26) has a control valve (36) which functions to control the mass flow rate of air in inlet (26) thereby controlling the flame temperature in the burner in order to maintain the burner flame temperature in a particular range (col. 2, lines 10-13, lines 24-49).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a temperature regulated start-up burner configured to meter air in Goebel's fuel processor, as taught by Vartanian, in order to maintain the burner flame temperature in a particular range.

With respect to claim 2, Goebel teaches wherein a flow of the hot gas/exhaust gas is guided so that the hot gas/exhaust gas heats the autothermal reactor/reformer (14) without material contact with the catalyst material (col. 4, lines 47-54 and col. 5, lines 23-34).

Regarding limitations recited in claims 7 and 9 which are directed to a manner of operating disclosed device, neither the manner of operating a disclosed device nor material or article worked upon further limit an apparatus claim. Said limitations do

not differentiate apparatus claims from prior art. See MPEP § 2114 and 2115.

Further, process limitations do not have patentable weight in an apparatus claim.

See *Ex parte Thibault*, 164 USPQ 666, 667 (Bd. App. 1969) that states "Expressions relating the apparatus to contents thereof and to an intended operation are of no significance in determining patentability of the apparatus claim."

7. Claims 3-6 and 10 are rejected under USC 103(a) as being unpatentable over Goebel et al (US 6,838,062 B2), and in view of Vartanian et al. (4,943,493), as applied to claim 1 above, and further in view of Chludzinski et al. (4,473,622).

With respect to claim 3, Goebel as modified discloses all claim limitations as set forth above but fails to show wherein a flow of the hot gas is guided into a reaction chamber of the autothermal reactor. Chludzinski teaches rapid starting reactor (fig. 1) wherein a flow of the hot gas (from burner (15)) is guided into a reaction chamber of the autothermal reactor/catalytic cracker (17) in order to bring the catalytic cracking bed up to the temperature at which cracking reaction is initiated (col. 3, lines 27-36).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to guide the flow of the hot gas into a reaction chamber of the autothermal reactor in Goebel's modified fuel processor, as taught by Chludzinski, in order to bring the catalytic cracking bed up to the temperature at which cracking reaction is initiated.

With respect to claim 4, Goebel teaches wherein a flow of the hot gas/exhaust gas is guided into the reaction chamber/reformer (14) via the mixture formation chamber/inlet (40) (illustrated in fig. 1).

With respect to claim 5, Goebel teaches wherein a flow of the hot gas/exhaust gas is fed directly into the mixture formation chamber/inlet (40) (illustrated in figure 1).

With respect to claim 6, Goebel teaches wherein a heat exchanger (16) configured to exchange heat between a product gas/reformate gas stream (54) of the autothermal reactor/reformer (14) and air (38) supplied to the mixture formation chamber/inlet (40) (illustrated in fig. 1).

With respect to claim 10, Goebel as modified discloses all claim limitations as set forth above but fails to show wherein reactor system/fuel processor is disposed in a fuel cell-driven motor vehicle. Chludzinski teaches wherein reactor system/fuel processor is disposed in a fuel cell-driven motor vehicle in order to function as a highly effective fuel cell power source (col. 7, lines 33-37).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to dispose Goebel's modified reactor system/fuel processor in a fuel cell-driven motor vehicle, as taught by Chludzinski, in order for said reactor system to function as a highly effective fuel cell power source.

3. Claims 1 and 8 are rejected under USC 103(a) as being unpatentable over Hwang et al. (US 4,522,894), and in view of Vartanian et al. (4,943,493).

With respect to claim 1, Hwang teaches fuel cell power production system comprising a mixture formation chamber/mixer (fig. 2, 14) configured to form a mixture of a hydrocarbon or a hydrocarbon derivative (10) with water/steam (36) and air (20); an autothermal reactor/reformer (32) configured for simultaneous oxidation and steam reformation of the mixture (col. 14, lines 23-30), the autothermal reactor/reformer (32) including a catalyst material (4); and a start-up burner (24) configured to combust the hydrocarbon/anode vent gas (26) with air (22) (col. 17, lines 40-54) so as to heat at least one of the mixture formation chamber/mixer (14) and the autothermal reactor/reformer (32) to a respective operating temperature (col. 18, lines 10-15), said start-up burner (24) being configured to meter/flow an air supply to a mixing zone (14) where air of the air supply (20) is mixed with hot gas/hydrocarbon feed (10) coming out of the burner unit (24), an air supply (20) so as to regulate a temperature of the catalyst material, before the hot gas contacts the at least one of the mixture formation chamber/mixer (14) and the autothermal reactor (32) (illustrated).

Hwang fails to explicitly teach a temperature regulated start-up burner configured to meter air. Vartanian teaches a fuel cell power plant which has a burner, a reformer and a fuel cell, wherein the air inlet (fig. 1, 26) has a control valve (36) which functions to control the mass flow rate of air in inlet (26) thereby controlling the flame temperature in the burner in order to maintain the burner flame temperature in a particular range (col. 2, lines 10-13, lines 24-49).



It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a temperature regulated start-up burner configured to meter air in Hwang's power production system, as taught by Vartanian, in order to maintain the burner flame temperature in a particular range.

With respect to claim 8, Hwang teaches wherein the supply air (fig. 2, 22) includes bypass air (20); and the start-up burner (24) includes a housing (illustrated) configured for bypass air (20) to flow between the housing and the burner, the housing including a mixing zone (gas inlets (22) and (26), as illustrated, combine in burner (24)) configured to mix hot gas coming out of the burner (inside burner 24 (not shown) with the bypass air (20), and the burner unit (24) being disposed in the housing.

### ***Response to Arguments***

#### **35 USC § 103 Rejection**

Applicant argues that Goebel does not teach a temperature regulated start-up burner configured to meter air. Examiner respectfully disagrees. Goebel teaches a temperature regulated (col. 4, lines 64-60) start-up burner including a burner unit (12) configured to combust the hydrocarbon/fuel (30) with air (28). Goebel fails to teach wherein said temperature regulated start-up burner is configured to meter air. However, Vartanian teaches a fuel cell power plant which has a burner, wherein the air inlet (fig. 1, 26) has a control valve (36) which functions to control the mass flow rate of air in inlet (26) thereby controlling the flame temperature in the burner in

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order to maintain the burner flame temperature in a particular range (col. 2, lines 10-13, lines 24-49). Therefore, It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a temperature regulated start-up burner configured to meter air in Goebel's fuel processor, as taught by Vartanian, in order to maintain the burner flame temperature in a particular range.

Applicant further argues that Hwang does not teach a temperature regulated start-up burner configured to meter air. Examiner respectfully disagrees. The same argument as presented above applies.

Applicant argues that Vartanian does not teach a temperature regulated start-up burner configured to meter air and that his air supply is not metered to a mixing zone where the air is mixed with hot gases coming out of the burner unit as recited in claim 1. Examiner respectfully disagrees. Vartanian is used as a reference to teach the feature of metering air/oxidant to a burner using a valve. The feature of feeding air to a mixing chamber/inlet is already taught by Geobel as discussed above.

In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KH

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4/27/2006



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PRIMARY EXAMINER